AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

 (currently amended): An image matching system for retrieving a reference image similar to an input image, the image matching system comprising:

means for making a <u>first</u> match between the input image and a plurality of representative threedimensional object models:

means for making a <u>second</u> match between the reference image and <u>the plurality of</u> the representative three-dimensional object models: and

means for retrieving the reference image similar to the input image by using a result of based on
the first match between the input image and the representative three-dimensional object models and a
result of the second match-between the reference image and the representative three-dimensional object
models.

 (currently amended): The image matching system according to claim 1, further comprising: means for <u>finding-determining</u> a reference three-dimensional object model associated with the reference image similar to the input image; and

means for newly-retrieving the an updated reference image similar to the input image by using the determined reference three-dimensional object model and the input image.

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3. (currently amended): The image matching system according to claim 1, further comprising:

means for finding-determining a reference three-dimensional object model associated with the

reference image similar to the input image;

conversion means for squaring equating an input condition of the input image with that an input

condition of the reference image by converting the input image and/or the reference image on the basis of

based on the determined reference three-dimensional object model; and

means for retrieving the reference image associated with similar to the input image by making a

third match between the input image and the reference image squared in equated to the input condition of

the input image.

4. (currently amended): The image matching system according to claim 3, wherein the conversion

means previously converts at least the reference image, and squares an input condition of the input image

with that of the reference image prior to the means for making the second match making the second

match.

5. (currently amended): The image matching system according to claim 1, comprising:

image input means for inputting the input image;

a representative three-dimensional object model storage section for storing a- $\underline{\text{the}}$ plurality of $\underline{\text{the}}$

representative three-dimensional object models;

first image generation means for generating at least one comparison image close in input condition

to the input image $\underline{\text{every-for each}}$ representative three-dimensional object model $\underline{\text{among the plurality of}}$

the representative three-dimensional object models on the basis of based on the plurality of the

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representative three-dimensional object models stored in the representative three-dimensional object model storage section:

first image matching means for calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation means, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching means;

a reference image storage section for storing the reference images of objects;

a reference image matching result storage section for storing similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section; and

result matching means for extracting the reference image images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means and the similarities between the reference images and the plurality of the representative three-dimensional object models stored in the reference image matching result storage section.

6. (currently amended): The image matching system according to claim 5, further comprising:

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three-dimensional object model registration means for registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

reference image registration means for registering the reference images in the reference image storage section; and

reference image matching result update means for eonducting calculation of the similarities calculating a similarity using the second image matching means, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model registration means, or when a new reference image is registered in the reference image storage section by the reference image registration means, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section.

7. (currently amended): The image matching system according to claim 5, wherein the <u>first</u> image matching means calculates a similarity between the input image and a the at least one comparison image of the each representative three-dimensional object model every for a partial region of the input image,

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section; every- for the partial region of each of the reference images, and

the result matching means extracts the reference image images similar to the input image on the basis of based on the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model calculated by the first image matching means every for the partial region of the input image and the similarities between the reference images and the plurality of the representative three-dimensional object models, for the partial region of each of the reference images stored in the reference image matching result storage section-every partial region.

8. (currently amended): The image matching system according to claim 5, wherein

the result matching means calculates similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model and the similarities between the reference images and the plurality of the representative three-dimensional object models, and in the calculation, provides the resultant similarities with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the at least one comparison image of the each representative three-dimensional object-models model.

9. (currently amended): The image matching system according to claim 2, comprising: image input means for inputting the input image;

a representative three-dimensional object model storage section for storing a-the plurality of the representative three-dimensional object models;

first image generation means for generating at least one comparison image close in input condition to the input image every-for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the

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representative three-dimensional object models stored in the representative three-dimensional object model storage section;

first image matching means for calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation means, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching means;

a reference image storage section for storing the reference images of objects;

a reference image matching result storage section for storing similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

result matching means for extracting the reference images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means and the similarities between the reference images and the plurality of the representative three-dimensional object models stored in the reference image matching result storage section;

a reference three-dimensional object model storage section for storing reference three-dimensional object models associated with the each reference image among the reference images stored in the reference image storage section;

second image generation means for obtaining reference three-dimensional object models associated with the reference images extracted from by the result matching means, from the reference three-dimensional object model storage section, and generating at least one second comparison image close in input condition to the input image every-for each obtained reference three-dimensional object model on the basis of based on the obtained reference three-dimensional object models; and

second image matching means for calculating similarities between the input image and the at least one second comparison images image of each obtained reference three-dimensional object model generated by the second image generation means, and selecting a maximum similarity from among the at least one second comparison images associated with each of the of an obtained reference three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the reference three-dimensional object model based on the similarities calculated by the second image matching means.

10. (currently amended): The image matching system according to claim 9, further comprising: three-dimensional object model registration means for registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

reference image registration means for registering <u>the</u> reference images in the reference image storage section; and

reference image matching result update means for conducting calculation of the similarities calculating a similarity using the second image matching means, on a combination of a reference image

and a representative three-dimensional object model newly-generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by the three-dimensional object model registration means, or when a new reference image is registered in the reference image storage section by the reference image registration means, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section; and

three-dimensional object model generation means responsive to registration of a similarity between the reference image and the representative three-dimensional object model in addition of the calculated similarity to the similarities stored in the reference image matching result storage section eenducted-by the reference image matching result update means, for generating the reference three-dimensional object model associated with the reference image by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section on the basis of based on the added similarity, and registering the generated reference three-dimensional object model in the reference three-dimensional object model storage section.

11. (currently amended): The image matching system according to claim 10, wherein the three-dimensional object model generation means generates a the reference three-dimensional object models associated with each reference image among the reference images stored in the reference image storage section by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section every-for a partial region of each of the reference images, on the basis of based on similarities obtained every-between the partial region between of each of the reference images stored in the reference image storage section and

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the plurality of the representative three-dimensional object models stored in the representative threedimensional object model storage section, and registers the generated reference three-dimensional object model-models in the reference three-dimensional object model storage section.

12. (currently amended): The image matching system according to claim 9, wherein

the first image matching means calculates a similarity between the input image and a-the at least one comparison image of the each representative three-dimensional object model every-for a partial region of the input image,

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative threedimensional object models stored in the representative three-dimensional object model storage sections every for the partial region of each of the reference images, and

the result matching means extracts the reference image images similar to the input image on the basis of based on the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models-model calculated by the first image matching means every for the partial region of the input image and the similarities between the reference images and the plurality of the representative three-dimensional object models, for the partial region of each of the reference images stored in the reference image matching result storage section every partial region.

13. (currently amended): The image matching system according to claim 9, wherein

the result matching means calculates similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model

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and the similarities between the reference images and the plurality of the representative three-dimensional object models, and in the calculation, provides the resultant similarities with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the at least one comparison image of the each representative three-dimensional object-models model.

14. (currently amended): The image matching system according to claim 3, comprising: image input means for inputting the input image;

a representative three-dimensional object model storage section for storing a-the plurality of the representative three-dimensional object models;

first image generation means for generating at least one comparison image close in input condition to the input image every for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

first image matching means for calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation means, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative threedimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching means:

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a reference image storage section for storing the-reference images of objects;

a reference image matching result storage section for storing similarities between the reference images stored in the reference image storage section and the plurality of the representative three-

dimensional object models stored in the representative three-dimensional object model storage section;

result matching means for extracting the reference image-images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means and the similarities between the reference images and the plurality of the representative three-dimensional object models stored in the reference image matching result storage section;

a reference three-dimensional object model storage section for storing reference three-dimensional object models associated with the each reference image among the reference images stored in the reference image storage section;

image conversion means for obtaining reference three-dimensional object models associated with the reference images extracted from by the result matching means, from the reference three-dimensional object model storage section, squaring an equating the input condition of the input image with that the input condition of each of the reference image images extracted by the result matching means by converting the input image and/or the reference image images extracted by the result matching means, on the basis of based on the obtained reference three-dimensional object models, and generating a partial images respectively image of the input image and partial images of the reference image squared in images equated to the input condition with each other of the input image; and

partial image matching means for calculating a similarity between the partial image of the input image and the partial image images of the reference image images generated by the image conversion means.

15. (currently amended): The image matching system according to claim 14, further comprising: three-dimensional object model registration means for registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

reference image registration means for registering the reference images in the reference image storage section; and

reference image matching result update means for conducting calculation of the similarities calculating a similarity using the second image matching means, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by the three-dimensional object model registration means, or when a new reference image is registered in the reference image storage section by the reference image registration means, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section; and

three-dimensional object model generation means responsive to registration of a similarity between the reference image and the representative three dimensional object model in addition of the calculated similarity to the similarities stored in the reference image matching result storage section conducted by the reference image matching result update means, for generating the reference threedimensional object model associated with the reference image by combining the <u>plurality of the</u>
representative three-dimensional object models stored in the representative three-dimensional object
model storage section on the basis of based on the <u>added</u> similarity, and registering the generated
reference three-dimensional object model in the reference three-dimensional object model storage section.

16. (currently amended): The image matching system according to claim 15, wherein

the three-dimensional object model generation means generates a the reference three-dimensional object models associated with each reference image among the reference images stored in the reference image storage section by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section every-for a partial region of each of the reference images, on the basis of based on similarities obtained every-between the partial region between of each of the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object models reference three-dimensional object models in the reference three-dimensional object model storage section.

17. (currently amended): The image matching system according to claim 14, wherein

the <u>first</u> image matching means calculates a similarity between the input image and a-the at least one comparison image of the each representative three-dimensional object model every-for a partial region of the input image,

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative three-

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dimensional object models stored in the representative three-dimensional object model storage section,

every-for the partial region of each of the reference images, and

the result matching means extracts the reference image images similar to the input image on the

basis of based on the similarities between the input image and the at least one comparison image of the

each representative three-dimensional object models-model calculated by the first image matching means

every-for the partial region of the input image and the similarities between the reference images and the

plurality of the representative three-dimensional object models, for the partial region of each of the

reference images stored in the reference image matching result storage section every partial region.

18. (currently amended): The image matching system according to claim 14, wherein

the result matching means calculates similarities between the similarities between the input image

and the <u>at least one comparison image of the each</u> representative three-dimensional object models model and the similarities between the reference images and the plurality of the representative three-dimensional

object models, and in the calculation, provides the resultant similarities with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the at

least one comparison image of the each representative three-dimensional object-models model.

19. (currently amended): The image matching system according to claim 1, wherein an object of

the object-plurality of the representative three-dimensional object models is a human face.

20. (currently amended): An image matching method for retrieving a reference image similar to an

input image, the image matching method comprising:

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a step of making a <u>first</u> match between the input image and a plurality of representative three-

dimensional object models;

a step of making a second match between the reference image and the plurality of the

representative three-dimensional object models; and

a step of retrieving the reference image similar to the input image by using a result of based on the

first match between the input image and the representative three-dimensional object models and a result

 $\underline{\text{of the }}\underline{\text{second}}\underline{\text{match-between the reference image and the representative three-dimensional object models}.$

21. (currently amended): The image matching method according to claim 20, further comprising:

a step of finding determining a reference three-dimensional object model associated with the

reference image similar to the input image; and

a step of newly retrieving the an updated reference image similar to the input image by using the

 $\underline{\text{determined}}$ reference three-dimensional object model and the input image.

22. (currently amended): The image matching method according to claim 20, further comprising

the steps of:

a step finding determining a reference three-dimensional object model associated with the

reference image similar to the input image;

a conversion step of equating an input condition of the input image with that an input condition of

the reference image by converting the input image and/or the reference image on the basis of based on the

determined reference three-dimensional object model; and

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a step of retrieving the reference image associated with similar to the input image by making a third match between the input image and the reference image squared in equated to the input condition of the input image.

23. (currently amended): The image matching method according to claim 22, wherein at the conversion step, at least the reference image is previously converted, and an input condition of the input image is squared with that of the reference image prior to the means for making the second match making the second match.

24. (currently amended): The image matching method according to claim 20, comprising: an image input step of inputting the input image;

a step of storing a-the plurality of the representative three-dimensional object models in a representative three-dimensional object model storage section;

an a first image generation step of generating at least one comparison image close in input condition to the input image every for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

an a first image matching step of calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation means step, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative

three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum—which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching step;

a step of storing the reference images of objects in a reference image storage section;

a step of storing similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section, in a reference image matching result storage section; and

a result matching step of extracting the reference image images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means step and the similarities between the reference images and the plurality of the representative three-dimensional object models stored in the reference image matching result storage section.

25. (currently amended): The image matching method according to claim 24, further comprising: a three-dimensional object model registration step of registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

a reference image registration step of registering the reference images in the reference image storage section; and

a reference image matching result update step of conducting calculation of the similarities

<u>calculating a similarity using in the second</u> image matching means tep, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new

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representative three-dimensional object model is registered in the representative three-dimensional object model storage section by in the three-dimensional object model registration means step, or when a new reference image is registered in the reference image storage section by in the reference image registration means in, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section.

26. (currently amended): The image matching method according to claim 24, wherein at the first image matching step, a similarity between the input image and a-the at least one comparison image of the each representative three-dimensional object model every for a partial region of the input image is calculated every partial region,

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative threedimensional object models stored in the representative three-dimensional object model storage sections every for the partial region of each of the reference images, and

at the result matching step, the reference image-images similar to the input image is-are extracted on the basis of based on the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model calculated by the first image matching means every for the partial region of the input image and the similarities between the reference images and the plurality of the representative three-dimensional object models, for the partial region of each of the reference images stored in the reference image matching result storage section every partial region.

27. (currently amended): The image matching method according to claim 24, wherein

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at the result matching step, similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model, and the similarities between the reference images and the plurality of the representative three-dimensional object models are calculated, and in the calculation, the resultant similarities are provided with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the at least one comparison image of the each representative three-dimensional object-models model.

28. (currently amended): The image matching method according to claim 21, comprising: an image input step of inputting the input image;

a step of storing a-the plurality of the representative three-dimensional object models in a representative three-dimensional object model storage section;

an a first image generation step of generating at least one comparison image close in input condition to the input image every for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

an a first image matching step of calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation meansstep, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative three-dimensional object model among the plurality of the representative three-dimensional object

<u>models</u>, and regarding the maximum—which has a greatest similarity as a similarity between with the input image and the representative three dimensional object model based on the similarities calculated by the first image matching step;

a step of storing the reference images of objects in a reference image storage section;

a step of storing similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section, in a reference image matching result storage section; and

a result matching step of extracting the reference images images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means step and the similarities between the reference images and the plurality of the representative three-dimensional object models stored in the reference image matching result storage section;

a step of storing reference three-dimensional object models associated with the each reference image among the reference images stored in the reference image storage section;

a second image generation step of obtaining reference three-dimensional object models associated with the reference images extracted from by the result matching means tep, from the reference three-dimensional object model storage section, and generating at least one second comparison image close in input condition to the input image every-for each obtained reference three-dimensional object model on the basis of based on the obtained reference three-dimensional object models; and

a second image matching step of calculating similarities between the input image and the at least one second comparison images-image of each obtained reference three-dimensional object model generated by the second image generation meansstep, and selecting a maximum similarity from among

the at least one second comparison images associated with each of the of an obtained reference threedimensional object-models model among the obtained reference three-dimensional object models, and regarding the maximum- which has a greatest similarity as a similarity between with the input image and the reference three-dimensional object model based on the similarities calculated by the second image matching step.

29. (currently amended): The image matching method according to claim 28, further comprising: a three-dimensional object model registration step of registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

a reference image registration step of registering the reference images in the reference image storage section; and

a reference image matching result update step of conducting calculation of the similarities calculating a similarity using in the second image matching means step, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by-in the three-dimensional object model registration means step, or when a new reference image is registered in the reference image storage section by in the reference image registration means in, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section; and

a three-dimensional object model generation step of, in response to registration of a similarity between the reference image and the representative three-dimensional object model in addition of the calculated similarity to the similarities stored in the reference image matching result storage section

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eonducted-by the reference image matching result update meansstep, generating the reference threedimensional object model associated with the reference image by combining the <u>plurality of the</u> representative three-dimensional object models stored in the representative three-dimensional object model storage section on the basis of <u>based on</u> the <u>added</u> similarity, and registering the generated reference three-dimensional object model in the reference three-dimensional object model storage section.

30. (currently amended): The image matching method according to claim 29, wherein at the three-dimensional object model generation step, a-the reference three-dimensional object models associated with each reference image among the reference images stored in the reference image storage section is generated by combining the plurality of the representative three-dimensional object models storage section every-for a partial region of each of the reference images, on the basis of based on similarities obtained every between the partial region between of each of the reference images stored in the reference image section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object models stored in the representative three-dimensional object models storage section.

31. (currently amended): The image matching method according to claim 28, wherein at the <u>first</u> image matching step, a similarity between the input image and a-the at least one <u>comparison image of the each</u> representative three-dimensional object model every-for a partial region of the input image is calculated every partial region.

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section; every- for the partial region of each of the reference images, and

at the result matching step, the reference images similar to the input image is are extracted on the basis of based on the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model calculated by the first image matching means every-for the partial region of the input image and the similarities between the reference images and the plurality of the representative three-dimensional object models, for the partial region of each of the reference images stored in the reference image matching result storage section-every partial region.

at the result matching step, similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models models models are calculated, and in the calculation, the resultant similarities are provided with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the at least one comparison image of the each representative three-dimensional object models model.

32. (currently amended): The image matching method according to claim 28, wherein

 (currently amended): The image matching method according to claim 22, comprising: an image input step of inputting the input image; Application No.: 10/520,661 Attorney Docket No.: O85625

a step of storing a-the plurality of the representative three-dimensional object models in a representative three-dimensional object model storage section;

an-a first image generation step of generating at least one comparison image close in input condition to the input image every for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

an a first image matching step of calculating a similarity-similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation meansstep, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching step;

a step of storing the reference images of objects in a reference image storage section;

a step of storing similarities between the reference images stored in the reference image storage
section and the plurality of the representative three-dimensional object models stored in the representative
three-dimensional object model storage section, in a reference image matching result storage section; and
a result matching step of extracting the reference images similar to the input image on the

basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means

step and the similarities between the reference images and the <u>plurality of the</u> representative threedimensional object models stored in the reference image matching result storage section;

a step of storing reference three-dimensional object models associated with the each reference image among the reference images stored in the reference image storage section:

an image conversion step of obtaining reference three-dimensional object models associated with the reference images extracted from by the result matching meansstep, from the reference three-dimensional object model storage section, squaring an equating the input condition of the input image with that the input condition of each of the reference image-images extracted by the result matching step by converting the input image and/or the reference image-images extracted at the result matching step, on the basis of based on the obtained reference three-dimensional object models, and generating a partial images respectively image of the input image and partial images of the reference image-squared in-images equated to the input condition with each other of the input image; and

a partial image matching step of calculating a similarity between the partial image of the input image and the partial image-images of the reference image-images generated by the image conversion step.

34. (currently amended): The image matching method according to claim 33, further comprising: a three-dimensional object model registration step of registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

a reference image registration step of registering the reference images in the reference image storage section; and

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a reference image matching result update step of eonducting calculation of the similarities calculating a similarity using in the second image matching meansstep, on a combination of a reference image and a representative three-dimensional object model newly-generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by in the three-dimensional object model registration meansstep, or when a new reference image is registered in the reference image storage section by in the reference image registration meansin, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section; and

a three-dimensional object model generation step of, in response to registration of a similarity between the reference image and the representative three-dimensional object model in addition of the calculated similarity to the similarities stored in the reference image matching result storage section eonducted by the reference image matching result update meansstep, generating the reference three-dimensional object model associated with the reference image by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section on the basis of based on the added similarity, and registering the generated reference three-dimensional object model in the reference three-dimensional object model storage section.

35. (currently amended): The image matching method according to claim 34, wherein at the three-dimensional object model generation step, a-the reference three-dimensional object models associated with each reference image among the reference images stored in the reference image storage section is generated by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section every-for a partial region of

each of the reference images, on the basis of based on similarities obtained every between the partial region between of each of the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section, and the generated reference three-dimensional object model storage section.

36. (currently amended): The image matching method according to claim 33, wherein at the <u>first</u> image matching step, a similarity between the input image and a-the at least one <u>comparison image of the each</u> representative three-dimensional object model every-for a partial region of the input image is calculated every partial region.

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section; every for the partial region of each of the reference images, and

at the result matching step, the reference images images similar to the input image is are extracted on the basis of based on the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model calculated by the first image matching means every for the partial region of the input image and the similarities between the reference images and the plurality of the representative three-dimensional object models; for the partial region of each of the reference images stored in the reference image matching result storage section every partial region.

37. (currently amended): The image matching method according to claim 33, wherein

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at the result matching step, similarities between the similarities between the input image and the at

least one comparison image of the each representative three-dimensional object models model and the

similarities between the reference images and the plurality of the representative three-dimensional object

models are calculated, and in the calculation, the resultant similarities are provided with weights on the

basis of based on candidate precedence of similarities between the input image and the comparison

images and the at least one comparison image of the each representative three-dimensional object-models

model.

38. (currently amended): The image matching method according to claim 20, wherein an object of

the object plurality of the representative three-dimensional object models is a human face.

39. (currently amended): A computer readable recording medium storing a program for making a

computer execute an image matching method to retrieve a reference image similar to an input image, the

image matching method comprising:

a step of making a first match between the input image and a plurality of representative three-

dimensional object models;

a step of making a second match between the reference image and the plurality of the

representative three-dimensional object models; and

a step of retrieving the reference image similar to the input image by using a result of based on the

first match between the input image and the representative three dimensional object models and a result

of the second match-between the reference image and the representative three-dimensional object models.

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40. (currently amended): The image matching program-computer readable recording medium

according to claim 39, wherein the image matching method further comprising comprises:

a step of finding determining a reference three-dimensional object model associated with the

reference image similar to the input image; and

a step of newly-retrieving the an updated reference image similar to the input image by using the

determined reference three-dimensional object model and the input image.

41. (currently amended): The image matching program-computer readable recording medium

according to claim 39, wherein the image matching method further comprising comprises the steps of:

a step finding determining a reference three-dimensional object model associated with the

reference image similar to the input image;

a conversion step of equating an input condition of the input image with that an input condition of

the reference image by converting the input image and/or the reference image on the basis of based on the

determined reference three-dimensional object model; and

a step of retrieving the reference image associated with similar to the input image by making a

third match between the input image and the reference image squared in equated to the input condition of

the input image.

42. (currently amended): The image matching program computer readable recording medium

according to claim 41, wherein at the conversion step, at least the reference image is previously

converted, and an input condition of the input image is squared with that of the reference image prior to

the means for making the second match making the second match.

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43. (currently amended): The image matching program computer readable recording medium according to claim 39, the image matching method comprising:

an image input step of inputting the input image;

a step of storing a-the plurality of the representative three-dimensional object models in a representative three-dimensional object model storage section:

an-a first image generation step of generating at least one comparison image close in input condition to the input image every-for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object models storage section;

am-a first image matching step of calculating a similarity-similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation meansstep, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching step;

a step of storing the reference images of objects in a reference image storage section;

a step of storing similarities between the reference images stored in the reference image storage section and the <u>plurality of the</u> representative three-dimensional object models stored in the representative

three-dimensional object model storage section, in a reference image matching result storage section; and

a result matching step of extracting the reference images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models model calculated by the first image matching means step and the similarities between the reference images and the plurality of the representative three-dimensional object models stored in the reference image matching result storage section.

44. (currently amended): The image matching program-computer readable recording medium according to claim 43, the image matching method further comprising:

a three-dimensional object model registration step of registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

a reference image registration step of registering the reference images in the reference image storage section; and

a reference image matching result update step of eonducting calculation of the similarities

calculating a similarity using in the second image matching means step, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by in the three-dimensional object model registration means step, or when a new reference image is registered in the reference image storage section by in the reference image registration

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 $\underline{\text{means}\underline{\text{in}}}, \text{ and adding }\underline{\text{a result of the calculation-}\underline{\text{the calculated similarity}}} \text{ to } \underline{\text{results-}\underline{\text{the similarities stored}}} \text{ in } \underline{\text{the calculation-}\underline{\text{the calculation-}\underline{\text{the calculated similarity}}}} \text{ to } \underline{\text{results-}\underline{\text{the similarities stored}}} \text{ in } \underline{\text{the calculation-}\underline{\text{the calculation-}\underline{\text$

the reference image matching result storage section.

45. (currently amended): The image matching program-computer readable recording medium

according to claim 43, wherein

at the first image matching step, a similarity between the input image and a-the at least one

comparison image of the each representative three-dimensional object model every for a partial region of

the input image is calculated every partial region,

the reference image matching result storage section stores similarities between the reference

images stored in the reference image storage section and the plurality of the representative three-

dimensional object models stored in the representative three-dimensional object model storage section;

every for the partial region of each of the reference images, and

at the result matching step, the reference image-images similar to the input image is-are extracted

on the basis of based on the similarities between the input image and the at least one comparison image of

the each representative three-dimensional object models model calculated by the first image matching

means every-for the partial region of the input image and the similarities between the reference images

and the <u>plurality of the representative</u> three-dimensional object models, for the partial region of each of

the reference images stored in the reference image matching result storage section every partial region.

46. (currently amended): The image matching program computer readable recording medium

according to claim 43, wherein

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at the result matching step, similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model and the similarities between the reference images and the <u>plurality of the representative three-dimensional object models are calculated</u>, and in the calculation, the resultant similarities are provided with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the <u>at least one comparison image of the each representative three-dimensional object-models model</u>.

47. (currently amended): The <u>image matching program computer readable recording medium</u> according to claim 40, the image matching method comprising:

an image input step of inputting the input image;

a step of storing a-the plurality of the representative three-dimensional object models in a representative three-dimensional object model storage section;

an-a first image generation step of generating at least one comparison image close in input condition to the input image every-for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

an a first image matching step of calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation meansstep, and selecting a maximum-similarity with respect to comparison images associated with each the at least one comparison image of a representative

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three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three dimensional object model based on the similarities calculated by the first image matching step:

a step of storing the reference images of objects in a reference image storage section: a step of storing similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative

three-dimensional object model storage section, in a reference image matching result storage section; and

a result matching step of extracting the reference image images similar to the input image on the basis of based on the similarities between the input image and the at lease one comparison image of the each representative three-dimensional object models-model calculated by the first image matching means step and the similarities between the reference images and the plurality of the representative threedimensional object models stored in the reference image matching result storage section;

a step of storing reference three-dimensional object models associated with the each reference image among the reference images stored in the reference image storage section:

a second image generation step of obtaining reference three-dimensional object models associated with the reference images extracted from by the result matching means step, from the reference threedimensional object model storage section, and generating at least one second comparison image close in input condition to the input image every for each obtained reference three-dimensional object model on the basis of based on the obtained reference three-dimensional object models; and

a second image matching step of calculating similarities between the input image and the at least one second comparison images-image of each obtained reference three-dimensional object model

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generated by the second image generation means step, and selecting a maximum similarity from among the at least one second comparison images associated with each of the of an obtained reference threedimensional object-models model among the obtained reference three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the reference three-dimensional object model based on the similarities calculated by the second image matching step.

48. (currently amended): The image matching program computer readable recording medium according to claim 47, the image matching method further comprising:

a three-dimensional object model registration step of registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

a reference image registration step of registering the reference images in the reference image storage section; and

a reference image matching result update step of conducting calculation of the similarities calculating a similarity using in the second image matching means step, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by in the three-dimensional object model registration means step, or when a new reference image is registered in the reference image storage section by in the reference image registration means in, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matching result storage section; and

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a three-dimensional object model generation step of, in response to registration of a similarity between the reference image and the representative three-dimensional object model in addition of the calculated similarity to the similarities stored in the reference image matching result storage section eenducted by the reference image matching result update meansstep, generating the reference three-dimensional object model associated with the reference image by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section on the basis of based on the added similarity, and registering the generated reference three-dimensional object model in the reference three-dimensional object model storage section.

 (currently amended): The image-matching program-computer readable recording medium according to claim 48, wherein

at the three-dimensional object model generation step, a the reference three-dimensional object models associated with each reference image among the reference images stored in the reference image storage section is generated by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object models stored in the reference images, on the basis of based on similarities obtained every between the partial region between of each of the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object models stored in the representative three-dimensional object models storage section.

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 (currently amended): The image matching program computer readable recording medium according to claim 47, wherein

at the <u>first</u> image matching step, a similarity between the input image and <u>a-the at least one</u>

<u>comparison image of the each representative three-dimensional object model every-for a partial region of</u>
the input image is calculated <u>every-partial region</u>.

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section; every for the partial region of each of the reference images, and

at the result matching step, the reference <u>images images</u> similar to the input image <u>is are</u> extracted on the <u>basis of based on the</u> similarities between the input image and the <u>at least one comparison image of the each</u> representative three-dimensional object <u>models model</u> calculated by the <u>first</u> image matching means <u>every for the partial</u> region <u>of the input image</u> and <u>the similarities</u> between the reference images and the <u>plurality of the</u> representative three-dimensional object models, <u>for the partial region of each of the reference images</u> stored in the reference image matching result storage section <u>every partial region</u>.

 (currently amended): The image matching program computer readable recording medium according to claim 47, wherein

at the result matching step, similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model and the similarities between the reference images and the <u>plurality of the</u> representative three-dimensional object models are calculated, and in the calculation, the resultant similarities are provided with weights on the Attorney Docket No.: Q85625

basis of based on candidate precedence of similarities between the input image and the comparison images and the at least one comparison image of the each representative three-dimensional object-models model.

52. (currently amended): The image matching program computer readable recording medium according to claim 41, the image matching method comprising:

an image input step of inputting the input image;

a step of storing a-the plurality of the representative three-dimensional object models in a representative three-dimensional object model storage section:

an-a first image generation step of generating at least one comparison image close in input condition to the input image every for each representative three-dimensional object model among the plurality of the representative three-dimensional object models on the basis of based on the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section;

an a first image matching step of calculating a similarity similarities between the input image and each of the at lease one comparison images image of the each representative three-dimensional object model generated by the first image generation means step, and selecting a maximum similarity with respect to comparison images associated with each the at least one comparison image of a representative three-dimensional object model among the plurality of the representative three-dimensional object models, and regarding the maximum which has a greatest similarity as a similarity between with the input image and the representative three-dimensional object model based on the similarities calculated by the first image matching step:

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a step of storing the reference images of objects in a reference image storage section;

a step of storing similarities between the reference images stored in the reference image storage

section and the <u>plurality of the</u> representative three-dimensional object models stored in the representative three-dimensional object model storage section, in a reference image matching result storage section; and

a result matching step of extracting the reference image images similar to the input image on the

basis of based on the similarities between the input image and the at lease one comparison image of the

each representative three-dimensional object models model calculated by the first image matching means

dimensional object models stored in the reference image matching result storage section;

a step of storing reference three-dimensional object models associated with the each reference

step and the similarities between the reference images and the plurality of the representative three-

image among the reference images stored in the reference image storage section:

an image conversion step of obtaining reference three-dimensional object models associated with

the reference images extracted from by the result matching means tep, from the reference three-

dimensional object model storage section, squaring an equating the input condition of the input image

with that the input condition of each of the reference image-images extracted by the result matching step

by converting the input image and/or-the reference image images extracted at the result matching step. on

the basis of based on the obtained reference three-dimensional object models, and generating a partial

images respectively-image of the input image and partial images of the reference image squared in images

equated to the input condition with each other of the input image; and

a partial image matching step of calculating a similarity between the partial image of the input

image and the partial image images of the reference image images generated by the image conversion

step.

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53. (currently amended): The image matching program-computer readable recording medium according to claim 52. the image matching method further comprising:

a three-dimensional object model registration step of registering the plurality of the representative three-dimensional object models in the representative three-dimensional object model storage section;

a reference image registration step of registering $\underline{\text{the}}$ reference images in the reference image storage section; and

a reference image matching result update step of eonducting calculation of the similarities calculating a similarity using in the second image matching meansstep, on a combination of a reference image and a representative three-dimensional object model newly generated by registration, when a new representative three-dimensional object model is registered in the representative three-dimensional object model storage section by in the three-dimensional object model registration meansstep, or when a new reference image is registered in the reference image storage section by in the reference image registration meansin, and adding a result of the calculation the calculated similarity to results the similarities stored in the reference image matchine result storage section; and

a three-dimensional object model generation step of, in response to registration of a similarity between the reference image and the representative three-dimensional object model in addition of the calculated similarity to the similarities stored in the reference image matching result storage section eonducted by the reference image matching result update meansstep, generating the reference three-dimensional object model associated with the reference image by combining the <u>plurality of the</u> representative three-dimensional object models stored in the representative three-dimensional object

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model storage section on the basis of based on the added similarity, and registering the generated reference three-dimensional object model in the reference three-dimensional object model storage section.

54. (currently amended): The image matching program-computer readable recording medium according to claim 53, wherein at the three-dimensional object model generation step, a-the reference three-dimensional object models associated with each reference image among the reference images stored in the reference image storage section is generated by combining the plurality of the representative three-dimensional object models stored in the representative three-dimensional object model storage section every-for a partial region of each of the reference images, on the basis of based on similarities obtained every-between the partial region between of each of the reference images stored in the reference image storage section and the plurality of the representative three-dimensional object models stored in the representative three-dimensional object models storage section, and the generated reference three-dimensional object models is are registered in the reference three-dimensional object model storage section.

55. (currently amended): The image matching program computer readable recording medium according to claim 52, wherein

at the <u>first</u> image matching step, a similarity between the input image and a-the at least one comparison image of the each representative three-dimensional object model every-for a partial region of the input image is calculated-every partial region,

the reference image matching result storage section stores similarities between the reference images stored in the reference image storage section and the plurality of the representative three-

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dimensional object models stored in the representative three-dimensional object model storage section; every-for the partial region of each of the reference images, and

at the result matching step, the reference images images similar to the input image is are extracted on the basis of based on the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model calculated by the first image matching means every for the partial region of the input image and the similarities between the reference images and the plurality of the representative three-dimensional object models, for the partial region of each of the reference images stored in the reference image matching result storage section every partial region.

 (currently amended): The image matching program-computer readable recording medium according to claim 52, wherein

at the result matching step, similarities between the similarities between the input image and the at least one comparison image of the each representative three-dimensional object models model and the similarities between the reference images and the <u>plurality of the</u> representative three-dimensional object models are calculated, and in the calculation, the resultant similarities are provided with weights on the basis of based on candidate precedence of similarities between the input image and the comparison images and the <u>at least one comparison image of the each representative three-dimensional object-models model</u>.

57. (currently amended): The image matching program-computer readable recording medium according to claim 39, wherein an object of the object-plurality of the representative three-dimensional object models is a human face.